

## CLAIMS

What is claimed is:

1. An apparatus for tracing electrical shorts in a circuit under test, comprising:
  - means for producing a sufficiently continuous source of a substantially fixed current flow into a circuit under test;
  - means for continuously monitoring the voltage across said circuit under test;
  - and
  - means for audibly indicating a sudden change in circuit conductance.
2. An apparatus as recited in claim 1, wherein said means for producing a continuous source of fixed current comprises a reference circuit coupled to a control circuit having a feedback loop for maintaining a selected output current over a range of conductance for said circuit under test.
3. An apparatus as recited in claim 1, wherein said means for producing a continuous source of fixed current is configured for generating a fixed output current exceeding approximately one ampere.
4. An apparatus as recited in claim 1, wherein said means for producing a continuous source of fixed current is configured for generating a fixed output current within the range of from approximately one-half ampere up to approximately ten amperes.
5. An apparatus as recited in claim 1, wherein said means for continuously monitoring the voltage across said circuit under test comprises a voltage detector circuit configured for generating an output signal in response to detecting a sufficient voltage change across said circuit under test.
6. An apparatus as recited in claim 5, wherein said voltage detector is configured for generating said output signal in response to conductance changes in

said circuit under test which create a sufficient change in circuit under test voltage.

7. An apparatus as recited in claim 6, wherein said sufficient change in circuit under test voltage comprises a predetermined voltage change within the range of approximately 0.2 volts up to 1.0 volts.

8. An apparatus as recited in claim 7, wherein said sufficient change in circuit under test voltage comprises a predetermined voltage change within the range of approximately 0.4 volts up to 0.7 volts.

9. An apparatus as recited in claim 1, wherein said means for audibly indicating a sudden rise in circuit voltage comprises an audio annunciator coupled to said voltage monitoring means and configured for producing an audible output in response to said sudden rise in circuit under test voltage.

10. An apparatus as recited in claim 1, further comprising a current selection circuit configured to allow user selection of the amount of current being output by said continuous source of output current.

11. An apparatus for tracing electrical shorts in a vehicle circuit under test, comprising:  
a current source configured for maintaining a constant current output;  
a detector circuit configured for generating an output signal in response to detecting a change in the resistance of the circuit under test; and  
an annunciator circuit configured for generating an audible output in response to said output signal.

12. An apparatus as recited in claim 11, wherein said constant output current can be set in the range of from one ampere to ten amperes.

13. An apparatus as recited in claim 11, wherein said constant output current remains constant with a variation of less than approximately 0.1 amperes

within the voltage range of said constant current source.

14. An apparatus as recited in claim 11, wherein said constant output current remains constant with a variation of less than approximately 0.02 amperes within the voltage range of said constant current source.

15. An apparatus as recited in claim 11, further comprising a current selection circuit configured for selecting an output current from said current source.

16. An apparatus as recited in claim 15, wherein said output current comprises a current level at or exceeding approximately one ampere.

17. An apparatus as recited in claim 15, wherein said output current comprises a current level in the range of from approximately one-half ampere to ten amperes.

18. An apparatus as recited in claim 15, wherein said selected output current can be selected to be at or less than the maximum allowable current for said circuit under test.

19. An apparatus as recited in claim 15, wherein said selection circuit is configured for selecting one of multiple output currents.

20. An apparatus as recited in claim 11, wherein said detector circuit comprises a comparator circuit adapted to sense sudden changes in applied voltage at said constant current output.

21. An apparatus as recited in claim 11, wherein said annunciator circuit comprises an audio annunciator configured to generate an audio alert to the user.

22. An apparatus as recited in claim 21, wherein said annunciator circuit is configured to generate a fixed duration audio output in response to detecting a

sufficient change in circuit under test conductance.

23. An apparatus as recited in claim 21, wherein said annunciator circuit is configured to extend the fixed duration audio output in response to detecting additional changes in circuit under test conductance.

24. An apparatus for isolating shorts in a circuit under test within a vehicle, comprising:

- a power supply configured to supply operating and drive current;

- a voltage reference circuit;

- a selector coupled to said voltage reference circuit and configured for user selection of an output current, in the range of from approximately one-half ampere to ten amperes, which is suitable for testing the vehicle circuit under test;

- a current driver coupled to said voltage reference circuit and said selector for outputting a constant current as determined by the setting of said selector;

- output connections for said current driver configured for coupling to a circuit under test;

- a sensing circuit coupled to said current driver for generating an output signal in response to detecting a sudden change in voltage in the circuit under test which exceeds a predetermined value; and

- an annunciator coupled to said sensing circuit for generating an audio alert in response to said output signal.

25. An apparatus as recited in claim 24, wherein said annunciator comprises an audible buzzer.

26. An apparatus as recited in claim 24, wherein said constant output current remains constant and does not vary more than approximately 0.1 amperes.

27. An apparatus as recited in claim 24, wherein said constant output current remains constant and does not vary more than approximately 0.02 amperes.

28. An apparatus as recited in claim 24, wherein said annunciator circuit is configured to generate a fixed duration audio output which is extended in response to detecting additional changes in conductance in said circuit under test.

29. An apparatus as recited in claim 24, wherein said sudden change in voltage is determined in response to a voltage threshold within the range of approximately 0.2 to 1.0 volts.

30. An apparatus as recited in claim 24, wherein said sudden change in voltage is determined in response to a voltage threshold within the range of approximately 0.4 to 0.7 volts.

31. An apparatus as recited in claim 24, wherein said sudden change in voltage is determined in response to a voltage increase which exceeds a predetermined threshold within a given length of time.